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09/936,819	11/21/2001	Brent R. Carlson	11111-01 US/PCT	1480

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EXAMINER	
BAYARD, EMMANUEL	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/936,819	CARLSON ET AL.	
	Examiner	Art Unit	
	Emmanuel Bayard	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9-15 and 17-22* is/are allowed.

6)☒ Claim(s) *1-6,8,16 and 23-28* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because the abstract should compose of a single paragraph. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-Xxer are rejected under 35 U.S.C. 102(e) as being anticipated by Niu et al U.S. Patent No 6,263,195 B1.

As per claim 1, Niu et al teaches a method for real-time digital spectral analysis of wide-band signals comprising the steps of: receiving a wide-band signal (see abstract and figs. 2, 7 and col.4, lines 17-21); shifting the center frequency of the wide-band (see figs. 3, 7 element 44 col.1, lines 48-50 and col.5, lines 8-121 and col.6, lines 7-47)signal by a small fraction epsilon of its bandwidth; sampling and digitizing the wide-band signal (see figs. 1-2 element 12 and col.4, lines 26-36); processing the digitized wide-band signal using a digital filter (see fig.2, 3 element 37 and col.5, lines 12-65) ; and decimating (see fig.3 element 42 and col.5, line 14 and col.6, lines 14-15 and col.8, lines 30-33) the

digitally filtered wide-band signal.

As per claims 2 and 23, Niu et al teaches a method for real-time digital spectral analysis of wide-band signals comprising the steps of: receiving a wide-band signal (see abstract and figs. 2, 7 and col.4, lines 17-21); shifting the center frequency of the wide-band (see figs. 3, 7 element 44 col.1, lines 48-50 and col.5, lines 8-121 and col.6, lines 7-47)signal by a small fraction epsilon of its bandwidth; sampling and digitizing the wide-band signal (see figs. 1-2 element 12 and col.4, lines 26-36); de-multiplexing (see fig.2 element 13 and col.4, lines 34-43 and col.5, lines 5-10) the digitized wide-band signal into N parallel sample streams; processing the N parallel sample streams in parallel using N digital FIR filters (see fig.2, 3 element 37 and col.5, lines 12-65 and col.8, lines 42-43); and, determining 2.sup.k.multidot.N; k=0, 1, . . . sub-band signals by decimating (see fig.3 element 42 and col.5, line 14 and col.6, lines 14-15 and col.8, lines 30-33) the sample stream from each digital FIR filter by a factor of 2.sup.k.multidot.N; k=0, 1, . . . , wherein only every 2.sup.k.multidot.N.sup.th; k=0, 1, . . . sample is retained and the others are discarded.

As per claim 3, Niu et al inherently teaches wherein the wide-band signal is sampled at a sample rate of at least twice the bandwidth of the wide-band signal.

As per claim 4, Niu et al teaches wherein each of the N digital FIR filters has a different tap-weight (see col.3, lines 50-35).

As per claim 5, Niu et al inherently teach, wherein each digital FIR filters is a cosine symmetric digital FIR filter having a linear phase.

As per claim 6, Niu et al inherently teaches wherein the bandwidth of each digital FIR filter is approximately 1/N of the bandwidth of the wide-band signal.

As per claims 8 and 27, Niu et al teaches a complex multiplication (see col.5, lines 6-10) function, which is well known, is the art as to perform the same function as a phasor or rotator. Therefore Niu et al inherently teaches comprising the step of phase rotating the 2.sup.k.multidot.N; k=0, 1, . . . sub-band signals by phase .epsilon. using a digital phase rotator producing a de-rotated sub-band signal.

As per claim 24, Niu et al teach wherein the frequency shifter the center frequency comprise an analog mixer and a local oscillator (see fig. 7).

As per claim 25, Niu et al teach wherein the frequency shifter the center frequency comprise a digital single-sideband mixer (see fig.7).

As per claim 28, Niu et al inherently teaches wherein each of the N processors digitally cross-correlates the sub-band signal with a respective second sub-band signal.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Isaksson et al U.S. patent No 5,812,523.

As per claim 16, Isaksson et al teaches a method for cross-correlating de-rotated sub-band signals sub-band by sub-band, the method comprising the steps of: receiving 2.sup.k.multidot.N; k=0, 1, . . . pairs of first and second complex rotation is the same as the claimed (de-rotated) sub-band signals at 2.sup.k.multidot.N; k=0, 1, . . . cross-correlators, wherein each pair is received at a different cross-correlator of the 2.sup.k.multidot.N; k=0, 1, . . . cross-correlators (see abstract and fig.1 element X and col.3, lines 13-30 and col.5, lines 41-44 and col.6, lines 35-45) ; transforming each pair of first and second de-rotated sub-band signals at each of the 2.sup.k.multidot.N; k=0, 1, . . . cross-correlators by means of a Fourier Transform into frequency domain (see fig.1 element FFT and col.6, lines 30-67); complex cross-multiplying the Fourier transformed first and second de-rotated sub-band signals at each of the 2.sup.k.multidot.N; k=0, 1, . . . cross-correlators (see figs.4-5 and col. 635-67 and col.7, lines 1-10); and, time-averaging (see figs.4-5 element mean and col.2, lines 40-42 and col.4, lines 12 and col.6, lines 25-28) the cross-multiplied first and second de-rotated sub-band signals.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niu et al U.S. Patent no 6,263,195 B1 in view of Liljeryd et al Pub No 2004/0078205 A1.

As per claim 26, Niu et al teaches all the feature of the claimed invention except wherein each of the N processors re-quantizes the sub- band signal.

Liljeryd et al teaches re-quantizes sub-band signal (see page 13, paragraph 12).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Liljeryd into Niu as to accurately obtain the analyzed version of the audio signal as taught by Liljeryd (see page 13, paragraph 12).

Allowable Subject Matter

8. Claims 9-15 and 17-22 are allowed over the prior art of record.

9. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to anticipate or render obvious the following recited features: correcting each cross-power spectral point of each sub-band cross-spectrum result with a sub-band scaling term, a gain differential compensation term, a band shape correction term and a wide-band power gain term as recited in claims 9, 17. Re-quantizing the M multi-dot N sub-band signals by re-scaling and truncating; complex mixing each of the M multi-dot N re-quantized sub-band signals as recited in claim 21. Re-quantization by re-scaling

and truncating the 2.sup.k.multidot.N; k=0, 1, . . . sub-band signals in order to reduce downstream processing load as recited in claim 7.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Springer et al U.S. patent No 6,271,787 B1 teaches a system and method for detecting signals (***).

Allen U.S. patent no 4,066,842 teaches a method and apparatus for canceling noise pickup.

Niho et al U.S. patent No 5,184,134 teaches a fast phase difference.

Atarius et al U.S. patent no 6,226,336 B1 teaches a method and apparatus for detecting frequency synchronization.

Loseke et al U.S. patent No 6,449,244 B1 teaches an implementation of orthogonal narrowband channels (***).

Carney et al U.S. patent No 5,848,097 teaches a transceiver.

Zangi U.S. patent No 5,999,573 teaches a wideband channelization.

Wala U.S. patent No 6,836,660 B1 teaches a methods and systems for communicating in a cell network.

Hamdy et al U.S. patent No 6,229,998 B1 teaches a method and system for detecting In-band jammers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number

is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard
Primary Examiner
Art Unit 2631

January 31, 2005

EMMANUEL BAYARD
PRIMARY EXAMINER